



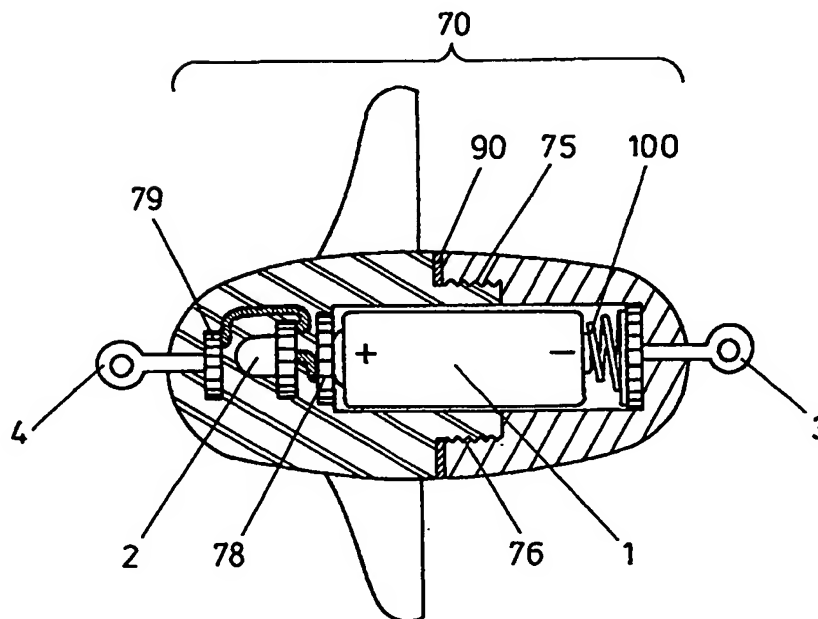
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A01K 85/01		A1	(11) International Publication Number: WO 99/33337
			(43) International Publication Date: 8 July 1999 (08.07.99)
(21) International Application Number: PCT/GB98/03870 (22) International Filing Date: 21 December 1998 (21.12.98) (30) Priority Data: 9727019.3 23 December 1997 (23.12.97) GB (71) Applicant (for all designated States except US): SENSA LURE LTD. [GB/GB]; Modern House, Summer Lane, Barnsley, West Yorkshire S70 2NT (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): PARKINSON, Robert [GB/GB]; 2 Bowfell View, Monk Bretton, Barnsley S70 2AE (GB). (74) Agents: CHUGG, David, John et al.; Appleyard Lees, 15 Clare Road, Halifax, West Yorkshire HX1 2HY (GB).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.	

(54) Title: **FISHING LURE**

(57) Abstract

The invention relates to a fishing lure of a type suitable for use in catching predatory fish such as pike. The lure includes a body member (70) which houses an electrical circuit comprising a combined LED and flashing circuit (2) and a battery (1). One of the battery terminals is connected directly to a first terminal of the combined LED and flashing circuit (2), and the second terminal of the battery is connected to an exposed terminal (3). A second terminal (4) of the combined LED and flashing circuit (2) also forms an exposed terminal. When the lure is immersed in water, current is able to flow through the water between terminals (3 and 4) so as to complete the electrical circuit. The lure tracks fish in three ways, by flashing, spinning (due to fins 73, 74) and due to the fish sensing the electrical current flowing through the water between terminals (3 and 4) by receptor cells arranged along the fish's lateral line.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LJ	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

- 1 -

FISHING LURE

The invention relates to a fishing lure and, in particular, but not necessarily exclusively, to fishing lures suitable for use in catching predatory fish such as pike, perch, trout, cod, bass or the like.

Traditionally, lures used for catching predatory fish have comprised dead or live bait. Unfortunately, the use of such natural bait has a number of disadvantages in that, for obvious reasons, bait cannot be reused, the bait tends to be rather smelly and there are of course storage and transportation problems. Also, predatory fish are better attracted by a moving lure and dead bait does not always give the best results.

With the above in mind, it can be seen that it would be desirable to produce a reusable synthetic lure which is efficient at attracting predatory fish. Purely mechanical lures which spin in running water have been developed, but these often fail to attract fish. In the past, designs have also been made which include a flashing light source to attract fish (see for example French patent application No. FR 2,720,894). Whilst such designs have been a step forward, they have also met with mixed results. Also, the invention disclosed in the aforementioned French patent application needs to be physically turned on or off and therefore is susceptible to accidental battery drain.

Electronic lures have been developed which detect when the lure is in water and automatically activate a flashing light source such as an LED. US 5,175,951 is an example of a fishing lure using this principle. However, the circuitry utilised in order to enable the LED to flash and to effectively sense immersion of the lure in water,

- 2 -

requires the adoption of a number of components such as NAND gates, resistors and capacitors.

Also, in prior art devices utilising some form of
5 water sensor to enable full operation of the device, the water sensor itself has not actually acted as a master on/off switch and has been incorporated into a subsidiary circuit. In such devices, there is the disadvantage that
10 even when the device is out of the water, a number of electronic components within the device associated with the water sensor are still drawing current. Such disadvantage is present not only in the above mentioned United States patent, but also in US patent 4,227,331 (Ursrey).

15

Accordingly, it is an aim of preferred embodiments of the present invention to address the abovementioned problems.

20

According to a first aspect of the invention, there is provided a fishing lure comprising: a body; a light source; and a power supply, the lure being arranged such that when the body is immersed in water, the power supply is arranged to supply power to the light source and, when
25 the body is removed from water, the power supply is automatically disconnected so as to have no power drain.

30

Preferably, a first terminal of said power supply is connected directly to a terminal of said light source and
35 a second terminal of said power supply is connected to an exterior region of said lure body so as to be exposed, in use, to water, the light source also having a second terminal, said second terminal also being connected to an exterior of said body so as to be exposed, in use, to water.

- 3 -

According to another aspect of the invention, there is provided a fishing lure comprising a body housing a power supply, the fishing lure including exposed terminals projecting from opposed ends of said body, the first of
5 said exposed terminals being connected directly or indirectly to a positive terminal of said power supply and a second of said exposed terminals being connected indirectly or directly to a negative end of said power supply, the fishing lure being characterised in that, when
10 the body is immersed in water, an electrical circuit is made between the opposed exposed terminals and electrical current flows from one terminal to another through the water to attract fish, the lure being arranged such that, when it is removed from water, the power supply is open
15 circuit.

The lure preferably includes a light source such as an LED having a first terminal connected to the power supply and a second terminal which forms one of said
20 exposed terminals.

By the arrangement above described, a full circuit is only made when a medium having a sufficiently low overall
25 resistance, is used to connect the, exposed, second terminal of the power supply to the, exposed, second terminal of the light source and in all other circumstances, no electrical circuit is completed. In the present invention, immersing the lure body in water
30 permits water to be the conducting medium which completes the electrical circuit to allow the light source to function and removal of the lure from water exposes the terminals to ordinary air, which is not a sufficiently good conductor.

35

- 4 -

Preferably, the exposed terminals are disposed, one at each end of the lure body, which, preferably, is of a generally cylindrical appearance. By positioning the exposed terminals in such a manner, when the lure is in use, an electric current passes through the water from one exposed terminal to the other.

It is believed that the electrical current mentioned above is sensed by predatory fish using the sensitive row of cells arranged along the length of their bodies known as the "lateral line". A fish's lateral line consists of sensitive receptor cells that can sense changes in the chemical and electrical properties of water.

Preferably, the body comprises first and second body parts, the first and second body parts being separable.

Preferably, the power supply comprises a battery. The battery may be replaced whenever it runs out, by detaching the first and second body parts from one another, changing the battery, and then reattaching the first and second body parts to one another.

At least one part of said body is preferably arranged to be clear. The light source is preferably located within said body and is visible through the clear body part.

Preferably, the light source is a light emitting diode (LED) and, in the most preferred embodiments, the light emitting diode is of a flashing type.

Preferably, the light source has a wide operating voltage range which may be, for instance, a range of

- 5 -

approximately three volts to thirteen volts. Preferably, the battery is a miniature twelve volt battery.

Preferably, the light emitting diode requires only a
5 small operating current.

The LED may emit light of any suitable wavelength

10 Because water has a relatively high electrical resistance and the current drain of the light source is low, the battery of the fishing lure has a relatively long life and may, for instance, operate well over a hundred hours without requiring change.

15 Preferably, the body is provided with fins which, as the lure moves relative to the water around it, cause the lure to spin.

20 In such a preferred embodiment, the fishing lure has three ways of attracting predatory fish, namely predatory fish will sense the small electric current generated outside the lure, will be attracted by the flashing light source and by the spinning movement of the lure.

25 Preferably, one of the exposed terminals is used to attach a fishing line and the other exposed terminal is used to attach a hook.

30 For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings, in which:

35 Figure 1 is a general perspective view of a preferred embodiment of a fishing lure according to the invention;

- 6 -

Figure 2 is a sectional view of the embodiment of Figure 1;

Figure 3 is a circuit diagram illustrating the electrical components of the present invention; and

Figures 4 to 6 show details of a body member of a second embodiment of the lure.

Referring initially to Figure 3, the electrical aspects of the fishing lure of the present invention will initially be discussed.

The circuit of Figure 3 comprises a twelve volt power source 1, an integrated light emitting diode with built in flashing circuit 2 and exposed terminals 3, 4. The exposed terminal 3 is connected to the negative side of the twelve volt battery 1, the positive terminal of the twelve volt battery 1 is connected to positive input terminal 5 of the integrated LED and flashing circuit 2 and the exposed terminal 4 is connected to a negative terminal 6 of the combined circuit 2.

The battery 1 may be of a type marketed under the name of Vinnicc under designation L1028. The combined LED and flashing circuit 2 may be of any suitable type, for example, of a type which has a wide operating voltage range of, for instance, between three and thirteen volts and flashes roughly twice a second. The LED used in prototypes has a forward current of approximately 16.5mA. It will be appreciated that when the exposed terminals 3, 4 are exposed to air, because the voltage of the battery 1 is low, it is insufficient to ionize air and there is no current flow between the terminals 3 and 4. Equally, it will be appreciated that if terminals 3 and 4 are

- 7 -

connected together then the full twelve volt output of the battery 1 will be placed across the terminals 5, 6 of the combined LED and flashing circuit 2 and will cause the light emitting diode to flash. What will also be appreciated is that if the resistance is placed between terminals 3 and 4, then the higher a resistance the lower the voltage drop between terminals 5 and 6 of the flashing LED circuit 2 will be. However, as long as the resistance is not so large as to reduce the voltage drop between terminals 5 and 6 to be below the minimum operating voltage of the LED circuit, then the device will function. Effectively, if the terminals 3 and 4 are joined together by a medium having a given resistivity, then the circuit shown will operate satisfactorily as long as the gap between terminals 3 and 4 is sufficiently small that the voltage drop between them does not become so great as to take the combined circuit 2 out of its operating voltage range.

In practical terms, it has been found that, with the above mentioned components fitted, prototypes of the fishing lure operate correctly if the exposed terminals 3 and 4 are disposed at opposed ends of a lure approximately 6cm or less in length.

Referring now to Figures 1 and 2, a first practical embodiment of the fishing lure of the present invention will now be described.

The fishing lure includes a body member 70 comprising first and second parts 71, 72. The first part 71 is a clear plastics moulding having a pair of attached fins 73, 74 disposed opposite one another toward a mid-portion of the body 70. The first body part 71 has the exposed terminal 4 protruding therefrom and that exposed terminal

- 8 -

4 is provided with an eye 41 to which a fishing line may be attached. The second body part 72 may be of an opaque material and has an exposed terminal 3 protruding therefrom. Terminal 3 also includes an eye 31 to which a hook 80 may be attached. First body part 71 and second body part 72 are connected together by means of a screw connection comprising an externally threaded male extension 75 forming part of the first body part 71 and an internally threaded female connection 76 forming part of the second body part 72. There is also included an O-ring rubber seal 90 to impede the ingress of water into the interior region of the body 70.

Both body parts 71 and 72 are hollow. The second body part 72 is adapted to receive the battery 1, the negative terminal of which is connected via a resilient biasing means such as spring 100 to the exposed terminal 3.

The first body part 71 has a cavity 77 formed therein, to accept the combined LED and flashing circuit 2 (not shown for clarity). At one end 78 of the cavity 77, there is provided a fixed plate against which a positive end of the battery 1 is adapted, in use, to abut. A second end 79 of the cavity 77 forms the electrical connection to the exposed terminal 4.

Figures 4 to 6 show an alternative body 70 to the one shown in Figures 1 and 2. In this alternative, the second body part 72 includes the externally threaded male extension 75 and the first body part 71 includes the female internally threaded socket 76.

In Figures 4 to 6, the internal electronic components of the fishing lure are not shown. However, it will be

- 9 -

appreciated that they may be fitted into the interior of the body 70 in similar fashion to that shown in Figures 1 and 2.

5 It will be appreciated that many variations may be made to the lure without going beyond the scope of the invention. For instance, dimensions and components mentioned herein may be varied. Also, many different types of light source may be used such as non-flashing
10 LEDs and/or diodes of various different colours (i.e. different wavelengths of emitted light). Further, in some embodiments, a light source could perhaps be omitted altogether, with fish being attracted primarily by the electrical current flowing outside the body of the lure.

15

 The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this
20 specification, and the contents of all such papers and documents are incorporated herein by reference.

 All of the features disclosed in this specification (including any accompanying claims, abstract and
25 drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

30 Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated

- 10 -

otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

5 The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any
10 method or process so disclosed.

- 11 -

CLAIMS

1. A fishing lure comprising:

a body;

5

a light source; and

a power supply, the lure being arranged such that when the body is immersed in water, the power supply is arranged to supply power to the light source and, when the body is removed from the water, the power supply is automatically disconnected so as to have no power drain.

2. A lure according to claim 1, wherein a first terminal of said power supply is connected directly to a terminal of said light source and a second terminal of said power supply is connected to an exterior region of said lure body so as to be exposed, in use, to water, the light source also having a second terminal, said second terminal also being connected to an exterior of said body so as to be exposed, in use, to water, the lure being arranged such that, when it is immersed in water, current flow occurs between said exposed terminals through the water so as to complete an electrical circuit.

25

3. A fishing lure comprising a body housing a power supply, the lure including exposed terminals projecting from opposed ends of said body, the first of said terminals being connected directly or indirectly to a positive terminal of said power supply and a second of said exposed terminals being connected indirectly or directly to a negative end of said power supply, the fishing lure being characterised in that, when the body is immersed in water, an electrical circuit is made between the opposed exposed terminals and electrical current flows

35

- 12 -

from one terminal to another through the water to attract fish, the lure being arranged such that, when it is removed from water, the power supply is open circuit.

5 4. A lure according to claim 3, further comprising a light source such as an LED having a first terminal connected to the power supply and a second terminal which forms one of said exposed terminals.

10 5. A lure according to claim 2, 3 or 4 wherein the exposed terminals are disposed at opposing ends of the lure body.

15 6. A lure according to any of the preceding claims, wherein the lure is of a generally cylindrical appearance.

20 7. A lure according to any of the preceding claims, wherein the body comprises first and second body parts, the first and second body parts being separable.

8. A lure according to claim 7, wherein separating the first and second body parts from one another enables a battery, which forms the power supply, to be changed.

25 9. A lure according to claim 7 or 8, wherein at least one of said body parts is clear.

30 10. A lure according to claim 9, wherein the light source is located within said body and is visible through the clear body part.

11. A lure according to any of the preceding claims, wherein the light source comprises a light emitting diode (LED).

35

- 13 -

12. A lure according to claim 11, wherein said LED is of a flashing type.

13. A lure according to claim 11, wherein the light
5 source also comprises an integrated circuit arranged to flash the diode.

14. A lure according to claims 11, 12 or 13, wherein the LED has a wide operating voltage range.

10

15. A lure according to claim 14, wherein the voltage range extends between approximately three and thirteen volts.

15 16. A lure according to any of the preceding claims, when the body is provided with fins which, as the lure moves relative to water around it, cause the lure to spin.

17. The lure according to claim 2, 3 or 4, or any of
20 claims 5 to 16 as dependent thereon, wherein one of the exposed terminals is utilised to attach a fishing line and the other exposed terminal is utilised to attach a hook.

18. A fishing lure substantially as herein described with
25 reference to Figures 1 to 3 or Figures 3 to 6.

-1/3-

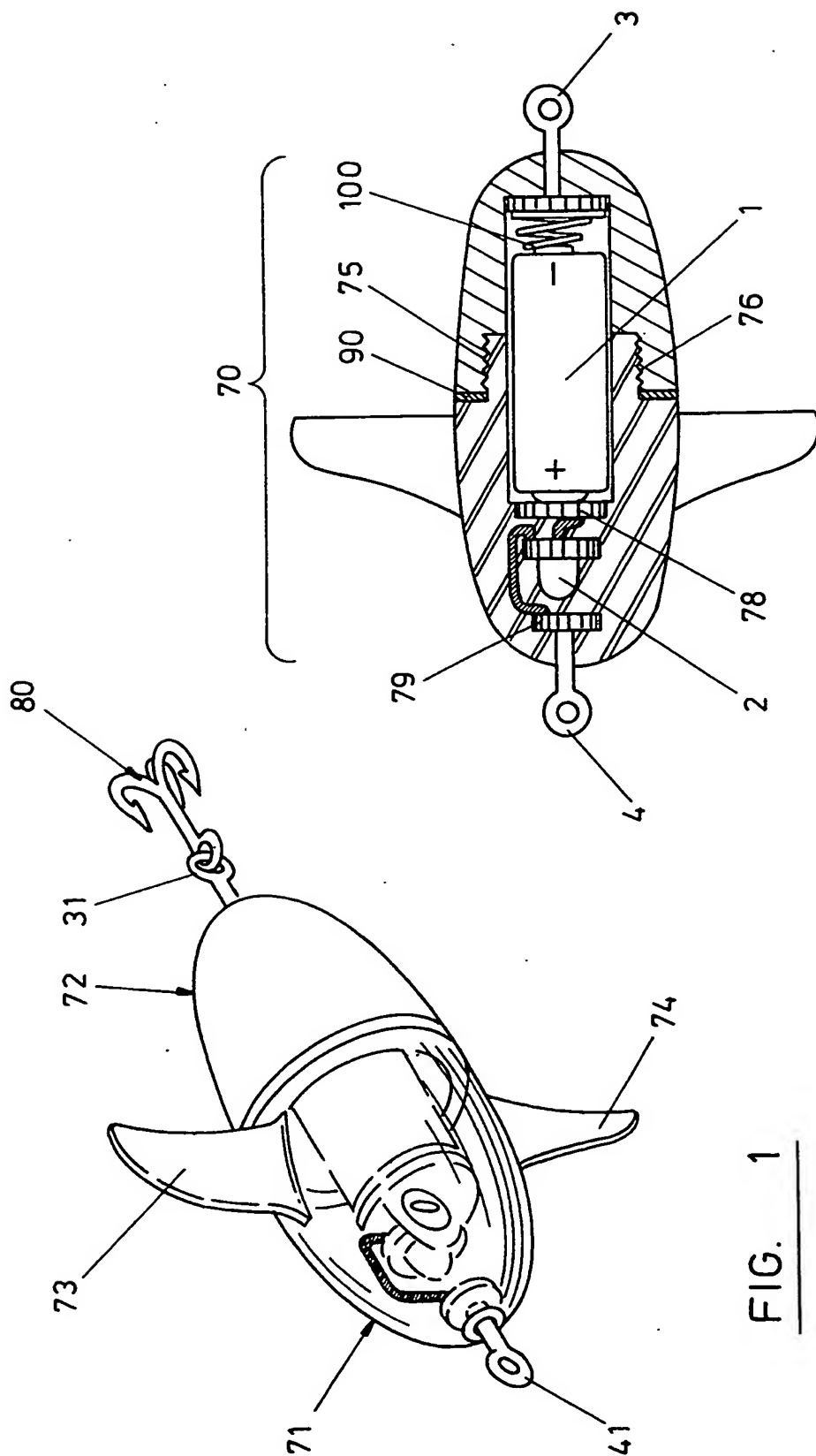
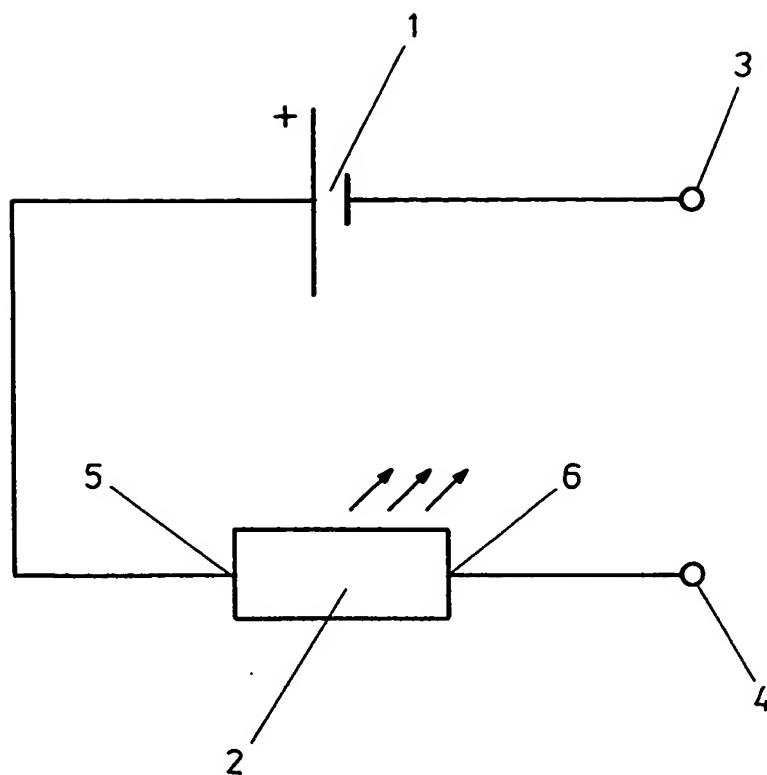


FIG. 1

FIG. 2

-2/3-

FIG. 3

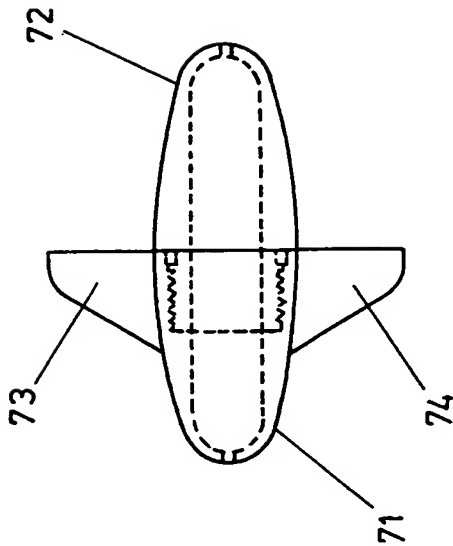


FIG. 4

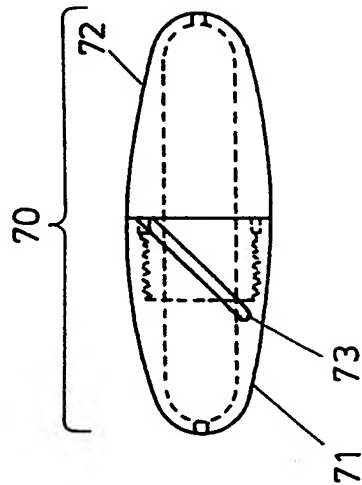


FIG. 5

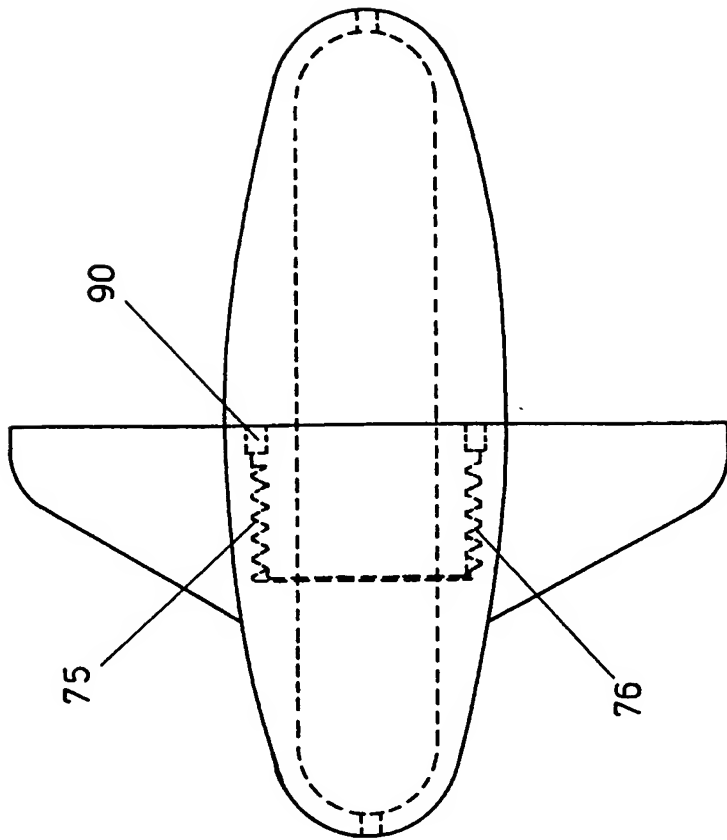


FIG. 6

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/03870

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A01K85/01..

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A01K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 709 640 A (MARTIN BERNARD) 17 March 1995 see the whole document ---	1-4,6, 11-14,18
X	US 4 227 331 A (URSREY CURTIS W ET AL) 14 October 1980 cited in the application	1
A	see column 3, line 45 - column 4, line 22; figures	2-4,11, 17,18
X	US 3 940 868 A (NORTHCUTT MICHAEL E) 2 March 1976	1
A	see column 3, line 4 - line 28 see column 3, line 50 - column 4, line 3; figures 2,5,7,8 ---	6-11,18
	--- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

29 March 1999

Date of mailing of the international search report

08/04/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Verdoodt, S

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/03870

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 42 05 848 A (KERNBACH KARL) 2 September 1993 see column 1, line 18 - column 2, line 5; figures	6-10, 16, 18
A	FR 2 607 360 A (NICOLAS RENE) 3 June 1988 see the whole document	1-4, 6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 98/03870

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2709640 A	17-03-1995	NONE	
US 4227331 A	14-10-1980	NONE	
US 3940868 A	02-03-1976	NONE	
DE 4205848 A	02-09-1993	NONE	
FR 2607360 A	03-06-1988	NONE	

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.